

compares the capabilities of Ceylon as a coffee-producing country with that of Arabia, he says: "Ceylon being a damp climate and the coffee fruit succulent it is gathered when at maturity, otherwise like cherries, it would mould on the trees. It is then placed in heaps for a day or two and the pulp allowed to ferment, in which state it is removed by washing. The pulp so washed off is only fit for manure. On the other hand, the climate of Arabia being dry the fruit is allowed to ripen and drop off of itself. In this case the pulp and other coverings dry on the berry and are often not removed for months after. It is from these husks that the *kishr* is made, or, to speak more correctly, this husk is the *kishr*, a decoction of which is used generally as a beverage throughout Arabia. The parchment and silver skin of the coffee amount to a mere nothing, but the dried husk of the Arabian berry amounts on an average to twenty per cent. The Arabs make their *kishr* coffee or a decoction of these husks by bruising about a handful, which is put into hot water in an earthen pan, and placed over a slow fire. A few bruised cardamoms and a little dry cinnamon or ginger is added, the whole being allowed to simmer for about half an hour, when it is ready for use, and is described as a most agreeable beverage. A handful of husks thus treated yields about ten Arab coffee cups, which are about the size of two of our ordinary tea cups. The price of the dried coffee husk at Aden is about two shillings for twenty-eight pounds.

THE Italian Government have granted the sum of 6,000 francs for a special investigation of the natural history of Calabria. This part of Italy is only very imperfectly known; in fact its geognosy, its fauna and flora, both present and palæontological, are a *quasi terra ignota* to scientific research. The task has been confided to Messrs. Dr. Forsyth Mayor for the Palæontology and Zoology of Vertebrata, Dr. Cavanna for Zoology of Invertebrata, Dr. D. Stefani for Geology, and Dr. Arcangioli for Botany—all very earnest and able workers. We may, therefore, look forward with confidence and interest to the results of this expedition.

THE Russian Geographical Society has undertaken the publication of a most important work, being a description of the upper parts of the Oxus, of the Hindu-Kush, and Western Himalayas. The object of the publication is to collect all existing information on the peoples inhabiting the above-named countries—the cradle of the Aryan family. The information will be collected from the works of Burns, Wood, Ferrier, Cunningham, Shaw, Hayward, Abramof, Grébenkin, Kuhn, Sobolef, and Fedchenko, and also that obtained from Chinese sources by Klaproth, Rémusat, St. Julien, Sakinf, Palladiz, &c. This compendium will be accompanied by an ethnographical map and vocabularies of local dialects, as well as by bibliographical notices scattered in many papers, especially English. The Committee intrusted by the Society with the discussion of this scheme will add to the work a general geographical sketch of the country. The work will be under the direction of Prof. J. P. Minayeff.

THE same Society is now preparing a scheme for the ethnographical and anthropological exploration of the Finnish tribes inhabiting the neighbourhoods of the Volga.

AT the last meeting, March 14, of the Russian Geographical Society, Lieut. Onatsévich gave an account of his geographical work during 1874 to 1876 in North-eastern Siberia and the Sea of Okhotsk. The most interesting part of his account was that devoted to the attempt he made in the clipper *Vsadnik* to reach Wrangell Land through Behring Strait. Under lat. 67° the ship met, however, with a thick impenetrable barrier of ice, and was compelled to take a westerly course. In this direction, also, she soon met with ice and was forced to return. Lieut. Onatsévich then cruised about in the open parts of the ocean, making

a series of very valuable measurements of depths, temperature of water, &c. He noticed thus the existence of a warm current which, after running through Behring Strait, takes a westerly direction. A great number of very valuable maps and of profiles of the sea-bottom were exhibited during the reading of the paper.

WE have received the Annual Report of the Goole Scientific Society. Some very good papers have been read at the meetings and an attempt has been made to systematically work out the natural history of the neighbourhood.

THE slab of sandstone, from Corncockle quarries, with the impression of footprints, which lately came into the possession of Mr. M'Meehan, Dumfries, has just been acquired by the Museum of Science and Art in Edinburgh. This slab is an unusually interesting one, as it has the impressions of two distinct footprints on it—*Chelichnus ambiguus* and *Herpetichnus sauropleisius*—Jardine ("Technology of Annandale"). On none of the slabs in the collection of the late Sir William Jardine, which is now in the Museum in Edinburgh, are to be found the footprints of two different animals, although both the above-mentioned footprints occur on separate slabs.

THE additions to the Zoological Society's Gardens during the past week include a Bennett's Wallaby (*Halmaturus bennetti*) from King's Island, presented by Miss E. Woollatt; a Malabar Green Bulbul (*Phyllornis aurifrons*) from India, presented by Mrs. Arabin, F.Z.S.; two Smooth Newts (*Triton teniatus*), European, presented by Master G. L. Sclater; eighteen Red-crested Whistling Ducks (*Fuligula rufina*), four Spotted-billed Ducks (*Anas pacilorrhyncha*), a Ring-necked Parrakeet (*Palawornis torquata*) from India, a Green Monkey (*Cercopithecus callitrichus*) from West Africa, a Brown Capuchin (*Cebus fatuellus*), two Scaly Doves (*Scardafella squamasa*), a Great American Egret (*Ardea egretta*) from South America, a White-fronted Guan (*Penelope jacucara*), a White eye-browed Guan (*Penelope supercilialis*) from South East Brazil, deposited; an Impeyan Pheasant (*Lophophorus impeyanus*) from the Himalayas, two Siamese Pheasants (*Euplocamus praelatus*) from Siam, purchased; two Alpine Marmots (*Arctomys marmotta*), European, received in exchange; a Chinchilla (*Chinchilla lanigera*) born in the Gardens.

SCIENTIFIC SERIALS

American Journal of Science and Arts, March.—In memoriam Fielding Bradford Meek.—Notes on the age of the Rocky Mountains in Colorado, by A. C. Peale.—On some points in connection with vegetation, by S. H. Gilbert.—Apparatus for quantitative fat extraction; composition of the sweet potato; composition of maize fodder, by S. W. Johnson.—Meteoric stone of Rochester, Fulton Co. Indiana, by C. U. Shepard.—Examination of the Waconda meteoric stone, Bates County meteoric iron, and Rockingham County meteoric iron, by J. Lawrence Smith.—Certain features of the valleys or water-courses of Southern Long Island, by Elias Lewis.

Poggendorff's Annalen der Physik und Chemie, No. 1, 1877.—Measurements of diamagneto-electric induction currents, by MM. Töpler and Ettingshausen.—On the absorption of radiant heat by aqueous vapour, by M. Haga.—On the dependence of galvanic resistance on current-strength, and Edlund's theory of diaphragm-currents, by M. Dorn.—On the intensity of fluorescence-light, by M. Lommel.—Remarks on Maxwell's electromagnetic theory of light, by M. Fröhlich.—New method of determining exactly the fusing-point of metals and of other matters which are bad conductors of heat, by M. Himly.—On the electric resistance of liquids under high pressure, by M. Herwig.—A perfectly air-tight barometer quickly, easily, and cheaply made without boiling, by M. Bohn.—On diffusion, and the question whether glass is impenetrable for gases, by M. Quincke.—On the polarised light of the rainbow, by M. Dechant.—On ardenite, and a method for separation of vanadic acid from argillaceous earth and iron oxide, by M. Bettendorff.—On the composition of pyrite of cobalt and allied minerals, by M. Rammelsberg.—On the Torricellian vacuum, by M. Moser.—Experiments with the

radiometer, by M. Neesen.—Researches on the motions of radiating and irradiated bodies, by M. Zöllner.—On the determination of the principal and focal points of a lens-system, by M. Hoppe.—On thermo-electric determinations of temperature, by M. Rosenthal.—On the nature of gas-molecules, by M. Boltzmann.

Beiblätter zu den Annalen der Physik und Chemie, Band i. Stück 2.—We note here a useful paper on recent experiments with the radiometer and their explanation; also a doctorate-dissertation by M. Lorentz, on the theory of reflection and refraction of light.

FROM the *Naturforscher* (February) we note the following papers: On the most refrangible part of the solar spectrum, by T. L. Soret.—On the distribution of the electric current in conductors under decomposition, by R. Lenz.—On the southern shore of the northern diluvial sea, by Herr Credner.—On the mixed occurrence of different vegetations, by Oscar Drude.—On the nature of the substance which emits light in the flames of hydrocarbons, by Karl Heumann.—On a prehistoric steppe in the Prussian province of Saxony, by A. Nehring.—On the history of Tertiary deposits in South-eastern Europe, by M. Tournouier.—On the differences in the chemical structure and in the digestion of higher and lower animals, by F. Hoppe-Seyler.—On a relation of chemical structure to the power of polarising light, by G. J. W. Bremer.—On the conduction of heat by liquids of different densities, by E. Sacher.—On the behaviour of palladium in the alcohol flame, by F. Wöhler.

THE *Archives des Sciences Physiques et Naturelles* (January), contains the following original papers:—On the tendrils of climbing plants, by Casimir de Candolle (see our note on this paper).—On the origin of the ancient alluvium, by Ernest Favre.—On static electricity, by E. Mascart.—Description of *Niphargus puteanus*, var. *Forellii*, by Alois Humbert (see our note on this paper).—Some researches made in the physiological laboratory of Geneva; on the formation of pepsine before and after death, by Prof. Schiff.—Note on the effect of the irritation of a nerve through which a constant electric current is passing, by Dr. B. F. Lautenbach.

THE *Journal of the Russian Chemical and Physical Societies* (vol. viii., part 9, December, 1876), contains the following papers:—On the action of bromine upon acetone, by N. Sokolowsky.—Synthesis of α oxybutyric acid, by S. Przibytsek.—On the pinacoline of methylethyl-acetone, by G. Lawrinowich.—On the synthesis and properties of diallyl-carbinol, by M. Saytzev.—On the action of the iodides of ethyl and allyl upon formate of ethyl, by the same and J. Kanonnikow.—On the synthesis and the properties of dimethylallyl carbinol, by the same and M. Michail.—Theoretical researches concerning the distribution of static electricity on the surface of conductors constituted of heterogeneous parts, by D. Bobylew.—On electric rays, by O. Chwolson.

Reale Istituto Lombardo di Scienze e Lettere, Rendiconti, vol. x. fasc. 2.—On the co-ordinates of points and of lines in a plane, and of points and planes in space (continued), by M. Casorati.—Case of mammary hypertrophy, by M. Scarenzio.—Results of observations on the amplitude of the daily oscillations of the magnetic needle in 1875 and 1876, at the Observatory of Brera, in Milan, by M. Schiaparelli.—On some differential equations with algebraic integral, by M. Brioschi.

SOCIETIES AND ACADEMIES

LONDON

Royal Society, March 8.—“Notes on Physical Geology,” by the Rev. Samuel Haughton, M.D. Dublin, D.C.L. Oxon., F.R.S., Professor of Geology in the University of Dublin.

No. I.—*Preliminary Formulæ relating to the Internal Change of Position of the Earth's Axis, arising from Elevations and Depressions caused by Geological Changes.*

In this paper the author proves the following preliminary formulæ, necessary for the further discussion of his subject:—

$$-\tan 2\theta = 935 \cdot 6 \rho \sin 2\lambda \quad \dots \quad (1)$$

where ρ is the ratio of the weight of an elevated mass to the weight of the whole earth;

λ is the latitude at which the elevation takes place, and θ is the final displacement of the earth's axis of rotation.

$$-r\theta = 14 \cdot 11 (\cos^3 \lambda' - \cos^3 \lambda) \quad \dots \quad (2)$$

where $r\theta$ is the displacement of the pole in English miles, caused by a continental slip of 5° longitude in breadth, and lying between the higher and lower latitudes of λ and λ' .

In proving the equations the author distinguishes between three level surfaces, viz.—

1. The surface of the sea.
 2. The zero surface of the solid earth.
 3. The zero surface, corrected for the weight of the ocean.
- The zero plane, from which the elevations are measured, is the surface of the ellipsoid similar to the sea surface, and containing the same volume as the total solid matter of the globe. It is thus found, assuming the mean height of the continents above the sea-level at about 1,000 feet, and the mean depth of the ocean at about two miles, we have, in miles,

$$x = \frac{2 \cdot 2 L}{W + L},$$

where x is the height of the zero plane above the present mean sea-bottom, and L , W are the areas of land and water;

$$L = 52 \text{ millions of square miles.}$$

$$W = 145 \quad \text{,,} \quad \text{,,}$$

Substituting we find—

$$x = 0 \cdot 58 \text{ mile.}$$

The zero plane, therefore, or original surface of the solid earth, before it became wrinkled by geological forces, lies at a depth of 1·42 mile below the sea-level. In using the equations we must therefore write—

$$\text{Elevation} = + 1 \cdot 62 \text{ mile (continent).}$$

$$\text{Depression} = - 0 \cdot 58 \quad \text{,,} \quad \text{(ocean).}$$

In calculating the motion of the pole caused by the ocean excavations, the weight of the sea-water must be considered, and, by chance, it happens that the weight of the sea-water somewhat more than counter-balances the weight of the surface-rock excavated; so that the depression of the ocean-bottoms of the earth beneath the zero plane have had little or no effect in shifting the position of the pole.

Assuming 1·026 and 2·75 as the densities of sea-water and surface-rock, we have for the excess of weight of water added above that of rock excavated; expressed in depth of rock, in miles—

$$\frac{2 \times 1 \cdot 026 - 0 \cdot 58 \times 2 \cdot 75}{2 \cdot 75} = 0 \cdot 17 \text{ mile.}$$

The introduction of the weight of the sea will thus give us (raising the zero plane by 0·17 of a mile)—

$$\text{Elevation} = + 1 \cdot 45 \text{ mile (continent),}$$

$$\text{Depression} = 0 \cdot 00 \quad \text{,,} \quad \text{(ocean).}$$

No. II.—*On the Amount of Shifting of the Earth's Axis, already caused by the Elevation of the existing Continents.*

Having shown in the preceding note that the motion of the earth's axis caused by the geological wrinkling of the earth's surface depends (in consequence of the weight of the sea-water) only on the continents, it remains to calculate the numerical amount of change of axis produced by each of the existing continents.

For this purpose the author selects the following meridians for the co-ordinates Y and X of the motion:—

Greenwich	...	...	0	...	+ Y
Rangoon	...	...	90	...	- X
Behring's Strait	...	...	180	...	- Y
Yucatan	...	...	270	...	+ X

Reckoning the longitudes eastward, round the whole circumference of the earth, the equation (2) gives—

$$r\theta = - 14 \cdot 11 (\cos^3 \lambda' - \cos^3 \lambda),$$

in which the meridian of each 5° of longitude is used, λ' and λ being the lowest and highest degrees of latitude of the land on each meridian.

The expression $\cos^3 \lambda' - \cos^3 \lambda$ is found by observation on the globe, and resolved into its components X and Y , regarding the North Pole as the axis moved.

The equation (2) is then used (by quadratures) to determine the total effect of each continent taken separately. The tables of quadratures are given in the paper, and the final results are—

Displacement of North Pole caused by each continent.